

2014-15

Federal Aid in Sport Fish Restoration
F13AF00410
F-57-R-33
Annual Performance Report

Connecticut Inland Fisheries

Northern Pike Management



Connecticut Department of Energy &
Environmental Protection
Bureau of Natural Resources
Inland Fisheries Division
79 Elm Street, Hartford, CT 06106
860-424-3474
www.ct.gov/deep/fishing
www.facebook.com/ctfishandwildlife





State of Connecticut
Department of Energy and Environmental Protection
Bureau of Natural Resources
Inland Fisheries Division



Grant Title: Inland Fisheries Research and Management
Study 2: Warmwater Fisheries Program
Project: Warmwater Fisheries Management
Job 5: Northern Pike Management

Period Covered: April 1, 2014 to March 31, 2015

Report Prepared by: Christopher McDowell and Ed Machowski

Job Personnel: Edward Machowski, Co-Job Leader
Christopher McDowell, Co-Job Leader
Justin Davis, Primary Staff
Eileen O'Donnell, Project Leader
Robert Jacobs, Program Coordinator
Timothy Barry, Assistant Program Coordinator

Date Submitted:

Approved by: Peter Arrestad
Director, Inland Fisheries Division

William Hyatt
Chief, Bureau of Natural Resources



www.facebook.com/ctfishandwildlife

The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to complying with the requirements of the Americans with Disabilities Act. Please contact us at (860) 418-5910 or deep.accommodations@ct.gov if you: have a disability and need a communication aid or service; have limited proficiency in English and may need information in another language; or if you wish to file an ADA or Title VI discrimination complaint.

Cover photo: Benoit Vnh with a pike caught in the Connecticut River East Hartford area during 2014.

Summary

The Connecticut DEEP Inland Fisheries Division (IFD) has created a number of successful Northern Pike fisheries as evidenced by angler survey results and numerous trophy fish awards. However, variable production of pike fingerlings in managed marshes remains a challenge to effective management of Connecticut pike fisheries. In 2014, various problems hampered management among the marshes; these included lack of broodstock, beavers, invasive vegetation, marsh sedimentation, and a damaged retainment structure. Fingerlings were stocked into five lakes and the lower Connecticut River in 2014. In addition, IFD continued the second year of a Northern Pike enhancement study that: 1) involves stocking yearling pike obtained from a private hatchery into Mansfield Hollow Reservoir and, 2) rearing pike fry acquired from another state in a managed nursery marsh.

Background

The Northern Pike is one of Connecticut's largest freshwater gamefish. Angler surveys conducted on Pike Management Lakes (PMLs) have documented that pike attract angling effort year-round, especially during the ice fishing season, and that a majority of anglers fishing these waters are in favor of Connecticut's Northern Pike Management Program (Machowski et al. 2011). The Northern Pike's large size and predatory nature also make it an effective consumer of a variety of forage fish. Predation by pike helps thin out smaller fish species, which prevents them from becoming "stockpiled" (overabundant and therefore slower-growing), thereby improving the overall quality of angling in a waterbody.

Maintenance and enhancement of Northern Pike fisheries is an important component of Connecticut's overall Inland Fisheries management program. Currently, IFD manages five PMLs: Bantam Lake, Mansfield Hollow Reservoir, Pachaug Pond, Quaddick Reservoir and Winchester Lake (Figure 1). These pike populations are supplemented or completely supported by annual stockings of 3-6 inch pike "fingerlings". IFD also stocks pike fingerlings in the Haddam area of the Connecticut River to supplement the self-sustaining population there and to replace any adults lost from spawning related mortality. Lake Lillinonah is not managed by IFD and is therefore not designated a PML, but is stocked annually with yearling pike by the Lake Lillinonah Authority.



Andrea Repko with a nice 11lb Housatonic River pike caught during 2014.

The purpose of Job 5 is to maintain and enhance Northern Pike populations in selected Connecticut waters in order to increase and improve fishing opportunities for Connecticut anglers. This report summarizes pike production, population assessments, and angler surveys conducted on pike fisheries during 2014-15.

Approach

Adult Northern Pike broodstock are collected in early spring using trap nets at Bantam Lake and a fixed weir trap at the Lower Haddam Marsh on the Connecticut

River. Broodstock are then stocked into managed marshes at a targeted ratio of two males to one female. The fingerlings spawned in the marshes are collected in June by draining or “drawing down” the marshes, and are then immediately stocked into the PMLs (rates for most PMLs range from 2 to 5 pike/acre) and the Connecticut River at Haddam (Figure 1).

Adult pike abundance is estimated in selected lakes using a Schnabel mark-recapture method (Hayes et al. 2007). Boat electrofishing, trap nets, gill nets and fixed-weir traps are used to collect pike for abundance estimates. Scale samples are collected from a subsample of adult pike and used to estimate age and growth rates (scales have annual growth rings that can be counted).

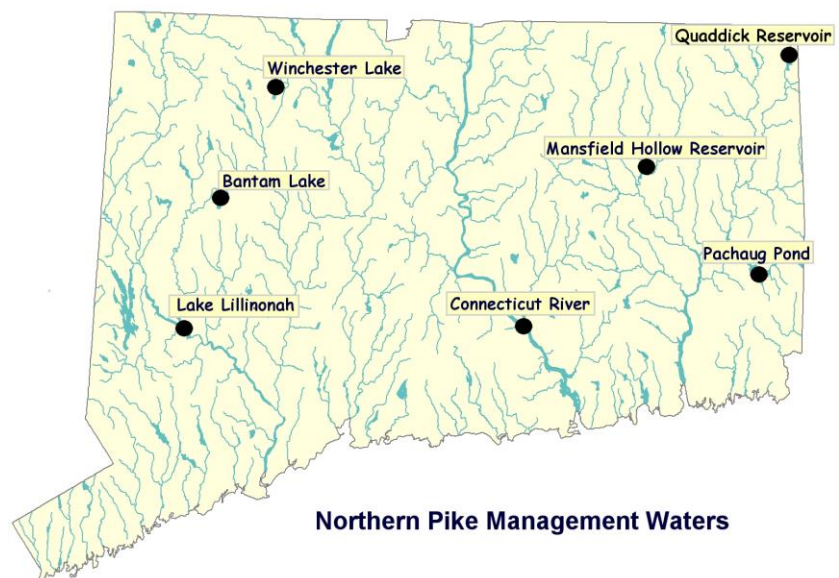


Figure 1. Connecticut waterbodies stocked and managed for Northern Pike.

Angler surveys are used to assess angler effort, catch, and harvest of pike and other species within PMLs during open water and ice fishing seasons. Surveys employ a standardized stratified random roving design (Malvestuto et al. 1978) and are conducted in selected lakes as resources permit (see “Lake and Large River Angler Surveys” report: Study 2, Job 2, for more detailed methods).

In 2013, two multi-year experiments were initiated to investigate alternative methods of producing or acquiring pike for stocking in the PMLs. Yearling pike (10-16 inch) were purchased from Zetts Fish Farm & Hatcheries, Inc. (Zetts Fish Farm), a commercial hatchery in Pennsylvania, and were stocked into Mansfield Hollow Reservoir in addition to the standard stocking of fingerling pike. Yearlings were stocked in both 2013 (60 fish) and 2014 (120 fish). The initial stocking density of 0.13 pike/acre (60 fish) was chosen to mimic that employed during most years at Lake Lillinonah, where this low density stocking strategy has proven to be successful (see Key Findings section). IFD biologists chose to double this stocking density in 2014. The relative performance of the two pike age classes will be tracked via angler survey and trap netting over the next several years to assess whether purchasing fish is an economically viable management strategy.

An alternative strategy to raising pike fingerlings in managed marshes was begun in 2013.



IFD biologist Chris McDowell with an adult broodstock pike (top left). Adult pike are stocked into managed marshes to spawn each spring (bottom photo is the Upper Haddam Marsh). Juveniles (right) are collected in June of the same year for stocking. Photos by Chris McDowell and Eric Schluntz.

Marshes in Wyantenock State Forest (town of Kent, CT) were chosen as the study site because they are not prone to flooding and also have consistently produced fingerlings by the standard practice of stocking pre-spawn adult pike. Known numbers of pike fry provided by the New Jersey Division of Fish and Wildlife were stocked into Wyantenock Marsh #3 in 2013 (130,000) and Wyantenock Marsh #4 in 2014 (50,000). Fry stocking densities were calculated to closely match typical densities produced by stocking spawning adults (10 fry/m²) (Bry and Souchon 1982). Fry stocking and stocking spawning adults will alternate between the marshes each year. Production of fingerlings from fry stockings will be compared to production from the other Wyantenock marsh using the standard method of stocking spawning adult pike.

Key Findings

Fingerling Production at Pike Spawning Marshes

Statewide production (Figure 2, Table 1) of fingerling pike during 2014 (7,690 fish) was lower than both the project production goal of 11,670 fingerlings and the average annual production over the previous 10 years (2002-13 average = 12,565 fish). The majority (41.1%) of fingerlings produced in 2014 came from the Lower Haddam Marsh. Table 2 lists the highlights from each managed marsh in 2014.

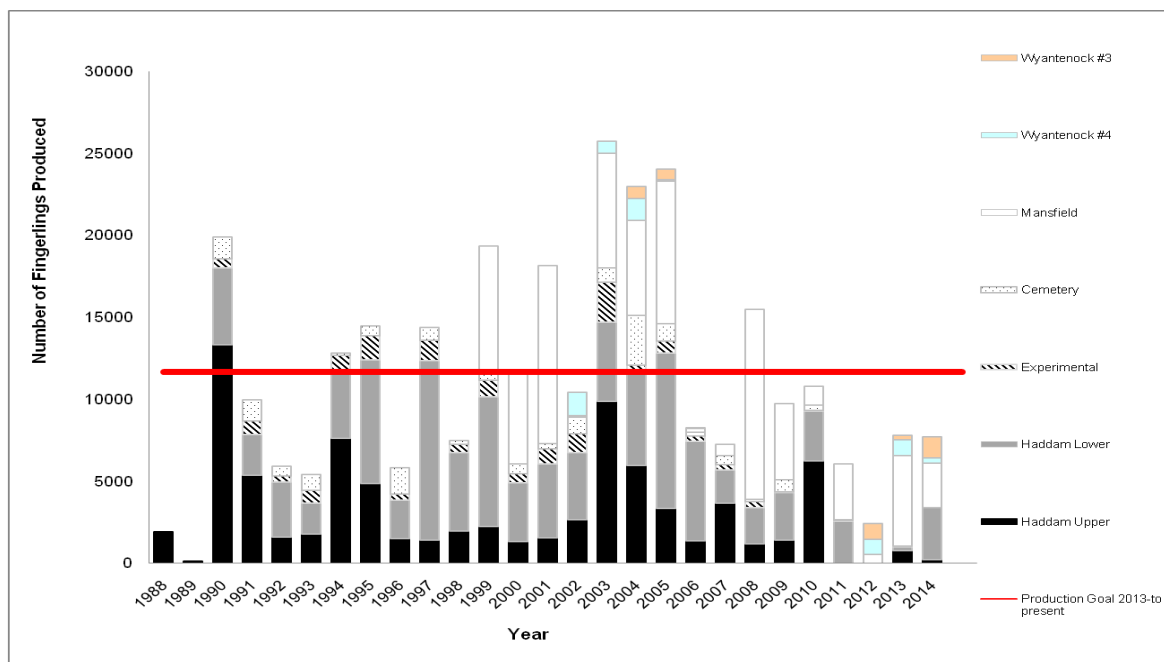


Figure 2. Northern Pike fingerling production from the seven IFD managed marshes, 1988 to present.

Table 1. Numbers stocked, number per acre, and target number per acre of fingerling pike stocked into each of the Connecticut PMLs in 2014.

Lake	Acres	Number Stocked	Avg. Length (inches)	No./Acre	Target No./Acre ¹
Bantam	947	1,266 ²	5.1	1.3	2.0 ³
Mansfield Hollow	460	2,883 ⁴ /120 ⁵	4.9 ⁶ 5.2 ⁷ 13.7 ⁵	6.3	5.0
Pachaug	841	1,015 ⁸	3.7	1.2	5.0
Quaddick	408	787 ⁸	3.7	1.9	5.0
Winchester	246	350 ⁹	5.2	1.4	5.0
Connecticut River, Lower area		1389 ¹⁰	4.4		
Total		7,722			

¹ These are "maintenance" stocking rates. Introduction rate is 10/acre.

² Fingerlings from Wyantenock #3.

³ Maintenance stocking rate for Bantam is lower than other lakes due to the occurrence of some natural reproduction.

⁴ Fingerlings from Mansfield Hollow and Upper Haddam Marshes.

⁵ Yearlings from Zetts Fish Farm, PA.

⁶ Fingerlings from Mansfield Marsh.

⁷ Fingerlings from Upper Haddam Marsh.

⁸ Fingerlings from Lower Haddam Marsh.

⁹ New Jersey fingerlings from Wyantenock Marsh #3.

¹⁰ Fingerlings from the Lower and Upper Haddam marshes.

Lake Lillinonah Volunteer Angler Report

Since 2006, the Lake Lillinonah Authority has supplemented the lake's pike population through the annual purchase and stocking of yearling (average length ~14 inches) pike from the Zetts Fish Farm in Pennsylvania. In most years, 200 yearlings were stocked (440 were stocked in 2009 and 600 were stocked in 2014). During all years except 2009 and 2012, IFD personnel gave these fish a distinguishing fin clip prior to stocking. One avid pike angler who regularly fished Lake Lillinonah during 2007-14 kept records of all pike caught and whether they were fin clipped (Table 3). Over half (51%) of the fish caught were reportedly fin clipped (the unmarked fish assumedly originated from natural reproduction in the Housatonic system and/or escapees from Bantam Lake). This suggests that the stocked yearlings make a substantial contribution to the pike fishery despite being stocked at a relatively low rate (2006-14 annual average = 0.17 yearlings/acre, compared to the current IFD target stocking rate of approximately five fingerlings/acre in most of the Connecticut PMLs).

Table 2. Highlights of the 2014 Northern Pike marshes.

Marsh (Acres)	2014 Production (2002-13 Ave. Production)	Length (inches)	Comments
Experimental Marsh (5)	0 (492)	N/A	Not run in 2014 due to insufficient broodstock and sedimentation of the marsh system.
Cemetery Marsh (6)	0 (670)	N/A	Not run in 2014 due to breach in dike which did not allow sufficient water to be retained.
Lower Haddam Marsh (18)	3,165 (3,594)	3.7	Beaver issues made drawing this marsh down more difficult than in previous years. Additionally, a conservative estimate of 40,000-50,000 age-0 bowfin were captured during the later part of the Lower Marsh drawdown. It is unclear whether the presence of bowfin affected fingerling production.
Upper Haddam Marsh (12)	210 (3,025)	5.2	Beaver issues also prevented IFD staff from drawing this marsh down in the normal manner because the screens were continually being clogged with debris. It was decided to allow this marsh to drain directly into the Lower Marsh and to trap fingerlings at the Lower Marsh only. Unfortunately, the beaver then relocated and clogged up the Lower Marsh outlet, preventing its timely drawdown. Insufficient seasonal resources to keep up with daily dam deconstruction, coupled with rising water temperatures, low water levels, and resulting low dissolved oxygen, likely resulted in significant mortality of both juveniles and the remaining adult broodstock.
Mansfield Marsh (12)	2,699 (4,111)	5.0	A beaver caused damage to a blocking panel which may have allowed an unknown number of fingerlings to escape prior to the panel being repaired. All fingerlings from this marsh were stocked into Mansfield Hollow Reservoir.
Wyantenock Marsh #3 (6)	1,266 (221)	5.1	This marsh was stocked with some (11) Connecticut River adults because of insufficient broodstock from Bantam Lake. All fingerlings from this marsh were stocked into Bantam Lake.
Wyantenock Marsh #4 (2)	350 (451)	5.1	50,000 fry (from New Jersey) stocked on April 25, 2014. The fingerlings did not exit the marsh until the very end of the drawdown. The reason for this is presently unclear. Additionally two large, thick weed mats upstream of the outlet structure (~ 66 ft long x 10 ft wide x 3 ft deep) trapped the fingerlings not allowing them to exit the marsh. All fingerlings from this marsh were stocked into Winchester Lake.

Table 3. Catch statistics reported by a pike angler fishing during the open water seasons of 2007-14 in Lake Lillinonah.

Year	Hours Fished	No. Unclipped Pike	No. Clipped Pike	Total Pike Caught	Percent of Pike Clipped	Catch Rate (Pike/hr)
2007	91	44	18	62	29%	0.68
2008	90	33	36	69	52%	0.77
2009	70	29	42	71	59%	1.01
2010	78	45	27	72	38%*	0.92
2011	81	27	55	82	67%	1.01
2012	84	57	69	126	55%	1.50
2013	91	39	35	74	47%	0.81
2014	87	31	54	85	63%	0.98
Total	672	305	336	641	-	-
Average	84	38	42	80	51%	0.96

*Contribution of stocked fish is likely underestimated in 2010 because IFD did not clip any of the 440 pike that were stocked in 2009.

Trophy Fish Awards

Nine Connecticut Trophy Fish Awards were given in 2014 to anglers who reported catching Northern Pike in excess of 10 pounds (harvested category) or 35 inches (catch-and-release category). Reported fish lengths ranged from 35 to 39 inches. Submissions were made for fish caught at Bantam Lake and Beseck Lake. Eight of the Northern Pike were submitted in the catch-and-release category. One Northern Pike from Bantam Lake (17lbs, 39 inches) was harvested. In addition, one hybrid Northern Pike x Chain Pickerel cross measuring 27.4 inches was submitted from Bantam Lake.

Discussion

Unreliable production of pike fingerlings at managed marshes due to factors largely outside IFD staff control continues to prevent IFD from stocking PMLs with adequate and consistent numbers of fingerlings as has been done previously. In Connecticut, natural reproduction of pike appears unsuccessful in maintaining viable fisheries in most of the PMLs. Therefore, successful management hinges on the ability to consistently stock PMLs with juveniles.

Investigations into alternative methods of production or alternative sources of juvenile pike are warranted to provide more consistent annual stocking numbers. The fry stocking experiment at the Wyantenock marshes and the experimental stocking of yearling pike from Zetts Fish Farm into Mansfield Hollow Reservoir will hopefully help enhance the future management of pike in Connecticut.

Recommendations

- Continue to investigate alternative methods of pike production in order to attain more consistent, higher quality pike fisheries.

Expenditures

Total Cost:	\$xxx,xxx
Federal Share:	\$xxx,xxx
State Share:	\$xx,xxx

References

- Bry, C. and Y. Souchon. 1982. Production of young northern pike families in small ponds: natural spawning versus fry stocking. *Transactions of the American Fisheries Society* 111:476-480.
- Hayes, D.B., J.R. Bence, T.J. Kwak, and B.E. Thompson. 2007. Abundance, biomass, and production. Pages 327-374 *in* C.S. Guy and M.L. Brown, editors. *Analysis and interpretation of freshwater fisheries data*. American Fisheries Society, Bethesda, Maryland.
- Machowski, E., C. McDowell, T. Barry, J. Davis, J. Bender. 2011. Northern pike management. Federal Aid to Sportfish Restoration. Final Report F-57-R-29. Connecticut Department of Environmental Protection, Hartford, Connecticut. 98 pp.
- Malvestuto, S. P., W. D. Davies, and W. L. Shelton. 1978. An evaluation of the roving creel survey with nonuniform probability sampling. *Transactions of the American Fisheries Society* 107:255-262.

Acknowledgements

We would like to thank all of the DEEP Inland Fisheries staff who helped out in the collection of pike broodstock and fingerlings as well as other associated pike data. We would also like to thank all the Seasonal Research Assistants who participated in the collection of these data: Andrew Bade, Mats Clark, Ian Croci, Megan Cruz, Jenifer Dupuis, Chris Finch, Matt Goclowski, Brooks Kolhi, Eric Lindquist, Kathleen Parillo, Alan Russo, Matt Smith and Shalyn Zappula. Special thanks to Pete Aarrestad and Bill Hyatt for reviewing the document and to the U.S. Fish and Wildlife Service, Federal Aid in Sport Fish Restoration for providing most of the funding.